2026 SMU/NAPE Case Study Competition

"Where Power, Data, Nuclear and Natural Gas Intersect"

Introduction and Case Background:

In the past two years, industry has seen a range of interests in artificial intelligence, data centers, and power generation collide. The development and uptake of artificial intelligence is increasing at a rapid rate. However, there is no AI without energy – specifically power for data centers. Similarly, AI may transform how the power industry, and its related fuel sources such as nuclear and natural gas, operate.

Affordable, reliable and sustainable energy will be a primary factor in the extent, speed and reach of AI development. Large data intensive companies such as Meta, Amazon and Microsoft are entering into agreements with power companies to reopen shuttered nuclear plants, expand existing generation sources and develop new sources. The market capitalization of AI related firms in the S&P 500 has increased $12 trillion since 2022. The increase in market cap of the top ten power producers in the S&P 500 from 2022 to 2025 is 43% whereas the market cap increase of the top ten AI firms is nearly twice that with some large firms as high as 200%.

Data centers accounted for approximately 1.5% of the world's electricity consumption in 2024, or 415 terawatt-hours (TWh). The United States accounted for the largest share at 45%, followed by China (25%) and Europe (15%). Globally, data center electricity consumption has grown by around 12% per year since 2017, more than four times faster than the rate of total electricity consumption. Nearly half of data center capacity in the United States is in five regional clusters. The sector accounts for substantial shares of electricity consumption in local markets.

In contrast, net generation in the United States has declined 1.3% since 2018 and has only increased roughly 5% since 2014. Globally the growth rate in generation has increased roughly 12% since 2014.

Key Investor Considerations:

- AI firms need power and power producers would like to increase their multiples by being more AI related plays to capture some of this value. AI related firms are rated for growth whereas power related firms are rated primarily for energy transition and return. This has led to a flurry of activities such as JVs, M&A, IPOs etc at the intersection of AI and power.
- Roughly 18-20% of U.S. power is generated by nuclear facilities, primarily light water reactors. Because of high up-front capital costs and regulatory impediments, growth in the next decade in nuclear power is likely to come from life extensions, improved operations and possibly previously mothballed reactors.
- In the U.S., generation from natural-gas-fired power plants accounts for the largest single share of electricity production—hovering around 40-45 % of total net generation in recent years. Natural-gas plants serve as a backbone for dispatchable generation**,** often complementing variable renewables (like wind/solar) because gas can ramp up and down relatively quickly. The cost-competitiveness of U.S. natural gas (thanks to shale-gas production) has made gas-fired generation a dominant source in much of the country,
- In the next 5-10 years, the U.S. is likely to **become one of the world's largest LNG exporters**, generating incremental demand for U.S. natural gas production and possibly raising domestic well-head and pipeline gas prices compared to a no-export scenario. Although LNG provides new demand opportunities, exporting transforms U.S. natural gas into a globally-priced commodity to some extent; thus, domestic generators may experience greater price volatility and exposure to global supply shocks (e.g., unexpected LNG terminal outages, geopolitical events).
- From a power-sector perspective, if LNG exports raise domestic natural-gas wellhead prices (or tighten supplies regionally), generators may benefit from higher margins (in certain cases) but also face cost risks.
- US power producers face different regulatory schemes in different states and in different ISOs and RTOs. One size fits all options for power producers are next

to impossible. Some power producers operate in competitive environments. Others remain regulated natural monopolies with an obligation to serve set territories.

The Case To 2040

Your team reports directly to the CEO of a mid-sized publicly traded pure-play company independent power company (IPP). who has just ushered your company through its twelve-year anniversary. Right now, the company's geographical focus is in the PJM regional transmission organization (RTO). Value creation is focused on Adjusted Free Cash Flow per share ("Adj FCF/share") and Adj FCF/share growth. Currently the firm has a market cap of approximately $20 billion and an enterprise value of $23 billion.

The company currently trades at 30X EV-to-EBITDA. Its capital budget is approximately $290 million per year. The company seeks to return 70% of its adjusted free cash flow to shareholders annually. The company has about 45 million shares outstanding and a current adjusted free cash flow per share of $10.20. It is targeting a growth per year of Adjusted Free Cash flow of over 30%. It generates approximately 55 TWhs at an average price of $51 mwh. Its O&M expenditures are approximately 650 million per year. It has roughly $3.1 billion in net debt and $260 million in cash on-hand. Its secured debt rating is BB. Its owned capacity is 13,000 MW, consisting of coal, natural gas and a singular nuclear plant. The company has about $6 billion in total assets with generating assets making up approximately half of those assets.

The company seeks to increase shareholder value through growth in earnings and market cap. Some argue that more AI related business will earn it a higher multiple but more data is needed to determine. However, it is a relatively modest sized player. Nevertheless, it believes it needs to enter the current fray of M&A, repositioning and other strategic alternatives as they don't want to be left out of the potential upsides.

Existing Generation Assets

Fuel Source	Generation Type	Total Nameplate Capacity MWH
Nuclear	Baseload	2,200
Natural Gas	Peaker	3,100
Natural Gas	Baseload	3400
Coal	Intermediate	600
Coal	Baseload	200
Coal/Natural Gas	Intermediate	1400

Current Strategic Options at Your Disposal

Scenario:

The Company is looking to grow its earnings and its market cap.

- Option 1 – expansion with buying existing power plants (grid) in the PJM RTO or other RTOs. Which ones would you purchase – gas, nuclear or other?
- Option 2 – expansion with new builds, new technology (on grid)
- Option 3– contracted model – buy or build co located plants with data centers (grid) either behind the meter or in front of the meter (state your intention). Could be structured as company owned or JV with a data center company or third party.

  In all of these options, a number of factors need to be explored in your presentation of the case:
  - Keep in mind, the PJM RTO is largely a competitive market with a capacity market where you can be compensated for both generation and capacity. These prices are determined by the PJM through daily market mechanisms or auctions for future capacity. Whatever you do, you still

must compete in the wholesale markets to keep a healthy base business. Additionally, the region has experienced a number of M&A transactions in recent years as the region contains Northern Virginia which is currently the US epicenter of data center development.

- How much to invest? In what? Equipment, engineering, land and in what proportions?
- How will you finance it? Debt, equity, cash?
- Ultimately, how and how much does your selected option benefit your investors? Faster adjusted free cash flow growth? A higher stock multiple? Faster top line growth? Higher dividends?

The attached Excel file provides assumptions on cost estimates, plant efficiency, capital structure and electricity generation for existing and new builds of power plants. These represent different fuel sources/scenarios that you may use to create a financial model of cash flows associated with various options and quantify the impacts of your strategy. Modeling should also help you decide which strategy(s) provide the optimal investment(s) and return(s) You may scale these numbers up or down accordingly depending on the size, type and capacity of your decided strategy and investment. If you need additional assumptions to build the model, please explicitly state them and explain the rationale for the assumptions.